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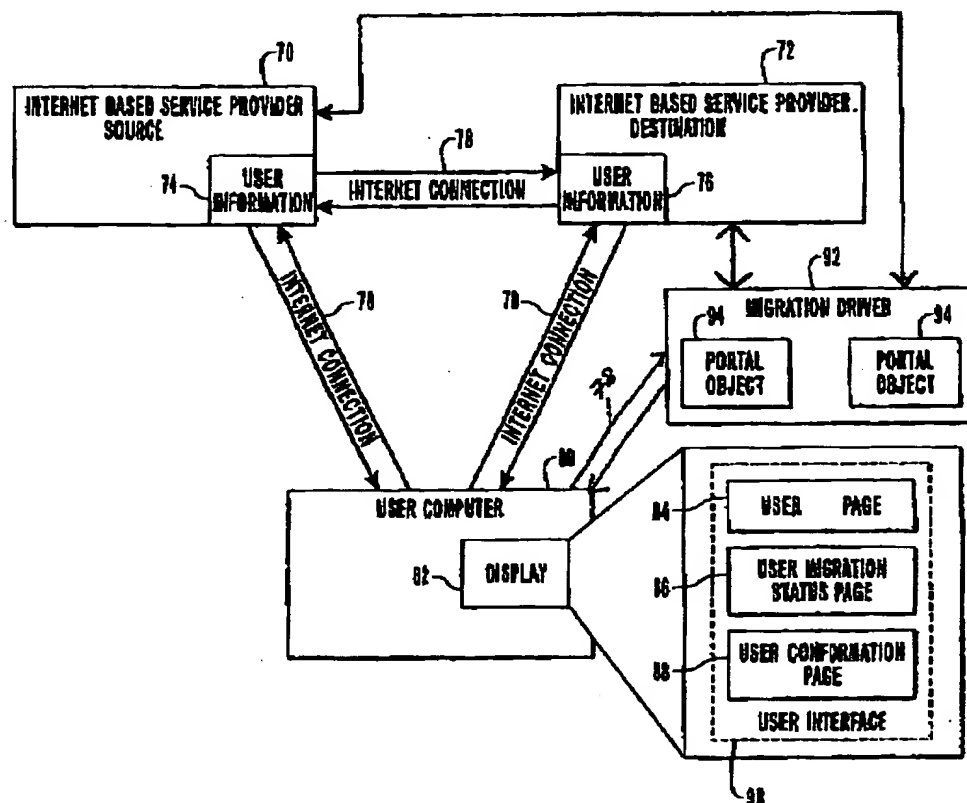
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(54) **MIGRATION AUTOMATIQUE ENTRE SERVICES WEB**

(54) **AUTOMATIC MIGRATION BETWEEN WEB-BASED SERVICES**



(57) A method and computer program product is provided to migrate user information from one internet-based service provider to another. The migration of user information includes obtaining access information from a user, which is used to access the respective source and destination service providers. Once access is obtained, the user information on the source service provider is located and transferred to the destination service provider. After the transfer is complete, the user is notified of the success or failure of the migration and the source and destination service providers are closed.



ABSTRACT OF THE INVENTION

A method and computer program product is provided to migrate user information from one internet-based service provider to another. The migration of user information includes obtaining access information from a user, which is used to access the respective source and destination service providers. Once access is obtained, the user information on the source service provider is located and transferred to the destination service provider. After the transfer is complete, the user is notified of the success or failure of the migration and the source and destination service providers are closed.

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of

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for

AUTOMATING MIGRATION BETWEEN WEB-BASED SERVICES

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BACKGROUND OF THE INVENTION

1. Related Applications

This application claims the benefit of U.S. Provisional Application Serial No. 60/115,048, filed January 8, 1999, and entitled "Web Automation of Email Migration," which is incorporated herein by reference.

2. The Field of the Invention

The present invention relates to collecting and transferring information on the world wide web. More specifically, the present invention relates to a method of automating the process of transferring user information from one internet based service provider to another internet based service provider.

3. The Prior State of the Art

The capabilities and resources of the world wide web (WWW) or internet have exploded in recent years. At one time, the internet was used almost exclusively by researchers to collaborate and share information. Today, the internet has become an immense network capable of sharing, distributing and disseminating large quantities of data. The internet has become a fertile commercial landscape with rival enterprises competing to provide customers with products, information and services of every stripe.

Consumers can purchase groceries, books, cars, videos, computer hardware and software, along with many other goods and services directly on the internet. Consumers now have access to financial services such as banks, stock brokers and lenders and can subscribe to information services and newspapers as well as access other services related to travel and entertainment. Communication services, including faxing and messaging, are

1 also available on the internet. Other internet enterprises or services act as portals, through
2 which a consumer can access services as well as other areas of the internet. Portals are
3 particularly useful because they search and categorize information and web sites on the
4 internet, which enables consumers to more readily find that for which they search. The
5 internet provides almost limitless possibilities.

6 Internet, or web-based service providers, in an effort to better serve their customers,
7 are motivated to learn about the people they serve. In fact, many internet-based service
8 providers require a new customer to provide them with a significant amount of information
9 in order to effectively service the customer. For instance, an internet service that notifies its
10 customers of low airfares needs to know which flights the customers prefer to fly. The
11 internet travel service may also need to know the customer's target price range, preferred
12 airline, frequent flier account numbers, credit card number for payment, home address for
13 delivery of ticket, meal preferences, seating preferences and destinations. This information,
14 obviously, must be supplied by the customer.

15 Another internet service attracting many consumers is internet or web-based e-mail
16 service providers. Establishing an account with an e-mail service provider requires little
17 more than a user name and a password, although most e-mail providers require additional
18 information such as the consumer's home address and telephone number. Effectively using
19 the account, however, requires much more information. Internet e-mail accounts generally
20 offer an address book which, once filled with the information for the user's frequent
21 correspondents, streamlines the experience of composing and sending email. The address
22 book may contain e-mail addresses, phone numbers, contact persons and other information
23 entered by the user. Internet e-mail providers may also provide other amenities such as
24 calendars, which also require the user to input information. Clearly, a user dedicates a

1 significant amount supplying information about themselves as well as entering information
3 into the address book and other amenities provided by the e-mail service provider. This
3 information belongs to the user and the e-mail provider is merely storing the information not
4 only as a convenience for the user but also as a selling point to retain the user as a customer.
5 Another type of user-owned information that accumulates on an Internet e-mail account is
6 the messages that a user receives and sends.

7 Regardless of the specific internet-based service considered, the long process of
8 entering extensive user information induces a forced loyalty by raising the cost of switching
9 to another service provider. The account holder seeking to migrate to an alternative provider
10 of the same service faces a loss of the benefit of having entered extensive user information
11 in the original internet-based service. The more customer information that resides on the
12 Internet-based service provider's servers, the greater the cost of switching to an alternative
13 provider, because the task of re-entering the information again is daunting.

14 Internet-based service providers understand these costs. The forced loyalty
15 described above, is referred to in the internet services industry as "stickiness." By
16 maximizing the effort required for users to enter user information, service providers aim to
17 reduce attrition and keep their sites customer-sticky. Thus internet-based service providers
18 have an incentive to maximize the investment of time necessary to enter the information, as
19 well as the difficulty of easily transferring that information to another web service. The
20 stickiness of an internet-based provider induces many customers to continue using an
21 inferior web-service even when superior alternatives exist. While another service provider
22 may better meet a user's needs and preferences, that user may not be willing to throw away
23 the time and effort he or she invested entering user information in order to gain the
24 advantages a superior provider offers. This underscores the need for the ability to quickly

1 and easily switch service providers in order to take advantage of technological advances and
2 superior products.

3 The stickiness of internet-based service providers results in part from the fact that the
4 browsing experience, from a client's perspective, is a strictly manual process. Web
5 browsers are used by people who navigate the web and manually interact with web pages
6 through keystrokes and mouse clicks to either input or retrieve various forms of data. As far
7 as web servers are concerned, the process is more automated as demonstrated by web pages
8 that gather data about a user. The data provided by a user is typically being gathered by a
9 machine and not a human. In other words, the data gathering process is automated. The
10 web experience, from the point of view of a user, is not automated. The present invention
11 gives people the ability to automate the transfer of their information from one web-based
12 service to another.

13 The ability to easily migrate from one internet-based provider to another is important
14 to both users and providers. In the initial phases of an internet-based service's availability,
15 virtually all new accounts represent customers who are new to the internet-based market for
16 such a service. During this phase, there is typically a flood of customers migrating from
17 traditionally-based services to their internet-based corollary. Because network economics
18 confer significant economic advantages on the internet-based services that capture the
19 largest market share, the internet-based service's top priority during this phase is capturing
20 as many of the new customers of such a service as possible. There are few incentives to
21 deploy technologies that streamline the migration process during this phase, from the
22 perspective of either the customers or the service providers.

23 As more and more potential customers obtain their first internet-based account in a
24 particular service area, the growth in the total number of new accounts slows significantly

1 and market for that particular internet-based service enters a second phase, in which the
2 challenges of keeping existing account holders, and attracting account holders from rival
3 providers rises in priority. During this second phase, the ability to more easily migrate from
4 one service to another is highly valued by customers, as well as by competing service
5 providers hoping to attract the customers of existing providers with innovative functionality,
6 and improved services.

7 During this second phase, customers are more experienced and more demanding,
8 having already experienced life with one internet-based provider of such services. Second
9 phase customers are comparison shoppers. They evaluate internet-based providers at a
10 number of levels of competitive differentiation. Some of the items that customers evaluate
11 are the reliability and speed of service, the ease of use of the site, the interface with the site,
12 the use of advertising, and the associated applications.

13 Second phase customers want to use the service that offers the best functionality.
14 However, a user who contemplates migrating to an internet-based service provider that
15 better meets his or her needs faces the barriers to migration discussed above. Currently,
16 extensive user created information cannot be extracted from an internet-based service
17 provider, except by a tedious field-by-field cut and paste.

18 This problem is addressed by the present invention which automates the collection
19 and transfer of user information from one internet-based service provider to another. In
20 addition to benefiting customers as a result of streamlining their ability to select the best
21 internet-based service provider, the migration functionality described herein also helps
22 create a more competitive marketplace. When customers can more easily change service
23 providers, improvements in functionality and service are more rapidly rewarded.
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1 Technological innovators and entrepreneurs benefit, as well as the customers who
2 experience more rapid advances in the quality of available services.
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OBJECTS AND SUMMARY OF THE INVENTION

The present invention has been developed in response to the present state of the art, and in particular, in response to these and other problems and needs that have not been fully or completely solved. Thus, it is an overall object of the present invention to provide an method and computer program product for migrating user information from one internet service provider to another internet service provider.

It is another object of one embodiment of the present invention to import user related data from one internet service provider to another.

It is a further object of one embodiment of the present invention to export user related data from one internet service provider to another.

It is yet another object of one embodiment of the present invention to delete user related information from an internet service provider.

It is a further object of one embodiment of the present invention to copy user related information from an internet service provider.

It is an additional object of one embodiment of the present invention to automate the migration of user related information from one internet service provider to another.

It is yet another object of one embodiment of the present invention to keep users' information in their control.

The migration of user information from one internet-based service provider to another is very difficult because the various internet-based service providers employ different data structures, formats, and presentation styles to store and provide user access to the user information stored on the provider's servers. Typically, the user information could be transferred or migrated only by a tedious cut and paste procedure. In such conditions, it can be easier to enter the information again rather than cut and paste. In order to overcome

1 these problems, the present invention provides methods and computer program products to
2 simplify and automate the migration of user information between internet-based service
3 providers.

4 The first step requires the user to not only initiate the migration, but also supply a
5 user name and password, which enable access to the user information. After the user name
6 and password have been obtained for both the source and destination internet-based service
7 providers, a portal object is created for each provider. The portal object is specific to a
8 particular provider and is able to handle the data organization and format of that provider.
9 The portal object also supplies routines that enable the user information stored on an
10 internet-based service provider to be located and transferred.

11 Once the user information has been located, it is transferred or sent to the new
12 provider. The information can be sent using standard data transfer procedures, or in an e-
13 mail: e-mail messages stored on a provider can be forwarded to the new destination in order
14 to preserve the e-mail header information.

15 After the user information has been transferred, the user has the option of deleting
16 the user information from the source provider, or the user can leave the user information as
17 it was found. Next, the source and destination service providers are closed, usually by
18 logging out.

19 Additional objects and advantages of the invention will be set forth in the description
20 which follows, and in part will be obvious from the description, or may be learned by the
21 practice of the invention. The objects and advantages of the invention may be realized and
22 obtained by means of the instruments and combinations particularly pointed out in the
23 appended claims. These and other objects and features of the present invention will become
24

1 more fully apparent from the following description and appended claims, or may be learned
2 by the practice of the invention as set forth hereinafter.
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BRIEF DESCRIPTION OF THE DRAWINGS

In order that the manner in which the above-recited and other advantages and objects of the invention are obtained, a more particular description of the invention briefly described above will be rendered by reference to specific embodiments thereof which are illustrated in the appended drawings. Understanding that these drawings depict only typical embodiments of the invention and are not therefore to be considered limiting of its scope, the invention will be described and explained with additional specificity and detail through the use of the accompanying drawings in which:

Figure 1 is an example system that provides a suitable operating environment for the present invention;

Figure 2 is a block diagram of one embodiment a system illustrating the migration of user data from one internet-based service provider to another internet-based service provider;

Figure 3 is a flow chart illustrating exemplary steps for migrating user data from one internet-based service provider to another internet-based service provider;

Figure 4a is a block diagram illustrating the flow of user data when the migration driver resides with the destination provider;

Figure 4b is a block diagram illustrating the migration of user data when the migration driver resides on a source provider;

Figure 4c is a block diagram illustrating the migration of user data when the migration driver is independent of the source provider, the destination provider, and the user; and

Figure 4d illustrates the migration of user data when the migration driver resides on a user computer.

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DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

The present invention provides methods and computer program products for automating the transfer of information over the internet. E-mail migration is one embodiment of the present invention and is used herein to describe the present invention. The present invention, however, is not limited to e-mail migration, but can be used with any internet-based service storing user information and the discussion is therefore not to be construed as limiting, but as exemplary.

An internet-based service provider enables a user to use the internet to receive or use the service provided. One such service is internet-based e-mail. In order to use internet-based e-mail, a user first establishes or creates an account. Typically, all that is required to establish an account is a user name and a user password. Many internet-based e-mail providers offer opportunities for the user to enter much more information as discussed above. As a result, a user typically enters a substantial amount of information to effectively use a web-based email service. The information supplied by the user is maintained and stored by the internet-based service provider.

Once a user has entered the personal information, the service may be used almost immediately. To conduct messaging or to send and receive e-mails, a user may access both sent and received messages and the e-mail metadata. The messages are what is sent to the intended recipient or recipients and may comprise text, graphics, images, sounds and internet links. E-mail metadata is information or data that concerns the actual message. Address books, user settings, and server settings are examples of e-mail metadata. Metadata also describes how, when, and by whom a particular set of data was collected, as well as how that data is formatted. In other words, metadata is data about data. For example, metadata about an e-mail message may include, but is not limited to, the name of the

recipient, the name of the sender, the font of the message text in the e-mail, the byte size of the e-mail and the address of the recipient.

Internet-based e-mail providers are distinguishable in several regards. Each provider typically stores the data representing e-mail messages and e-mail metadata in a different manner or location. Internet-based e-mail providers may also use proprietary formats and presentation layouts for their e-mail systems, and in order for a user to switch from one service provider to another, these problems must be overcome.

All internet-based service providers use a considerable amount of hardware and software to implement their services. The hardware and software, in the case of e-mail providers is frequently referred to as an e-mail server. Figure 1 is not only an example system of a suitable operating environment for the present invention, but is also illustrative of the hardware and software employed by internet-based service providers to provide their service.

The embodiments of the present invention may comprise a special purpose or general purpose computer comprising various computer hardware. Embodiments within the scope of the present invention also include computer-readable media having computer-executable instructions or data structures stored thereon. Such computer-readable media can be any available media which can be accessed by a general purpose or special purpose computer. By way of example, and not limitation, such computer-readable media can comprise RAM, ROM, EPROM, CD-ROM or other optical disk storage, magnetic disk storage or other magnetic storage devices, or any other medium which can be used to store the desired executable instructions or data structures and which can be accessed by a general purpose or special purpose computer.

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1 When information is transferred or provided over a network or other
2 communications connection to a computer, the computer properly views the connection as a
3 computer-readable medium. Thus, such a connection is also properly termed a computer-
4 readable medium. Combinations of the above should also be included within the scope of
5 computer-readable media. Computer-executable instructions comprise, for example,
6 instructions and data which cause a general purpose computer, special purpose computer, or
7 special purpose processing device to perform a certain function or group of functions. The
8 computer-executable instructions and associated data structures represent an example of
9 program code means for executing the steps of the invention disclosed herein.

10 Figure 1 and the following discussion are intended to provide a brief, general
11 description of a suitable computing environment in which the invention may be
12 implemented. Although not required, the invention will be described in the general context
13 of computer-executable instructions, such as program modules, being executed by a personal
14 computer. Generally, program modules include routines, programs, objects, components,
15 data structures, etc. that perform particular tasks or implement particular abstract data types.

16 Moreover, those skilled in the art will appreciate that the invention may be practiced
17 with other computer system configurations, including hand-held devices, multi-processor
18 systems, microprocessor-based or programmable consumer electronics, network PCs,
19 minicomputers, mainframe computers, and the like. The invention may also be practiced in
20 distributed computing environments where tasks are performed by remote processing
21 devices that are linked through a communications network. In a distributed computing
22 environment, program modules may be located in both local and remote memory storage
23 devices.
24

With reference to Figure 1, an exemplary system for implementing the invention includes a general purpose computing device in the form of a conventional computer 20, including a processing unit 21, a system memory 22, and a system bus 23 that couples various system components including the system memory to the processing unit. The system bus 23 may be any of several types of bus structures including a memory bus or memory controller, a peripheral bus, and a local bus using any of a variety of bus architectures. The system memory includes read only memory (ROM) 24 and random access memory (RAM) 25. A basic input/output system (BIOS) 26, containing the basic routines that help to transfer information between elements within the computer 20, such as during start-up, may be stored in ROM 24. The computer 20 may also include a magnetic hard disk drive 27 for reading from and writing to a magnetic hard disk, not shown, a magnetic disk drive 28 for reading from or writing to a removable magnetic disk 29, and an optical disk drive 30 for reading from or writing to removable optical disk 31 such as a CD-ROM or other optical media. The magnetic hard disk drive 27, magnetic disk drive 28, and optical disk drive 30 are connected to the system bus 23 by a hard disk drive interface 32, a magnetic disk drive-interface 33, and an optical drive interface 34, respectively. The drives and their associated computer-readable media provide nonvolatile storage of computer readable instructions, data structures, program modules and other data for the computer 20. Although the exemplary environment described herein employs a magnetic hard disk 27, a removable magnetic disk 29 and a removable optical disk 31, it should be appreciated by those skilled in the art that other types of computer readable media which can store data that is accessible by a computer, such as magnetic cassettes, flash memory cards, digital video disks, Bernoulli cartridges, random access memories (RAMs), read only memories (ROM), and the like, may also be used in the exemplary operating environment.

1 A number of program modules may be stored on the hard disk, magnetic disk 29,
2 optical disk 31, ROM 24 or RAM 25, including an operating system 35, one or more
3 application programs 36, other program modules 37, and program data 38. A user may enter
4 commands and information into the computer 20 through input devices such as a keyboard
5 40 and pointing device 42. Other input devices (not shown) may include a microphone, joy
6 stick, game pad, satellite dish, scanner, or the like. These and other input devices are often
7 connected to the processing unit 21 through a serial port interface 46 that is coupled to
8 system bus 23, but may be connected by other interfaces, such as a parallel port, game port
9 or a universal serial bus (USB). A monitor 47 or other type of display device is also
10 connected to system bus 23 via an interface, such as video adapter 48. In addition to the
11 monitor, personal computers typically include other peripheral output devices (not shown),
12 such as speakers and printers.

13 The computer 20 may operate in a networked environment using logical connections
14 to one or more remote computers, such as a remote computer 49. Remote computer 49 may
15 be another personal computer, a server, a router, a network PC, a peer device or other
16 common network node, and typically includes many or all of the elements described above
17 relative to the computer 20, although only a memory storage device 50 has been illustrated
18 in Figure 1. The logical connections depicted in Figure 1 include a local area network
19 (LAN) 51 and a wide area network (WAN) 52 that are presented here by way of example
20 and not limitation. Such networking environments are commonplace in offices enterprise-
21 wide computer networks, intranets and the Internet.

22 When used in a LAN networking environment, the computer 20 is connected to the
23 local network 51 through a network interface or adapter 53. When used in a WAN
24 networking environment, the computer 20 typically includes a modem 54 or other means for

1 establishing communications over the wide area network 52, such as the Internet. The
 2 modem 54, which may be internal or external, is connected to the system bus 23 via the
 3 serial port interface 46. In a networked environment, program modules depicted relative to
 4 the computer 20, or portions thereof, may be stored in the remote memory storage device. It
 5 will be appreciated that the network connections shown are exemplary and other means of
 6 establishing a communications link between the computers may be used.

7 Computer 20, illustrated in Figure 1 is also representative of the hardware and
 8 software used by internet-based service providers. Computer 20, with reference to internet-
 9 based e-mail providers, is representative of the servers and server software necessary to
 10 provide users with internet-based e-mail.

11 As used herein "source portal" and "destination portal" may refer to a web based
 12 service provider, a web page, a plurality of linked web pages, one or more web pages, a
 13 database or other data repository, a data store that is locally or remotely accessed, or any
 14 other computer, device or Internet domain having access to user data or any combination
 15 thereof.

16 Figure 2 is a block diagram representing the migration of user information from one
 17 internet-based service provider to another. In a general sense, Figure 2 is also representative
 18 of customer migration. Source portal 70 is an internet-based service provider that, in this
 19 embodiment, provides internet-based e-mail. Destination portal 72 is also an internet-based
 20 e-mail service provider. User information 74 is stored on source portal 70 and comprises, e-
 21 mail messages, e-mail metadata, user preference, address books and other user related and
 22 user supplied information. Source portal 70 comprises server hardware and server software,
 23 which permit source portal 70 to provide internet-based e-mail services. User information
 24 74 is stored on source portal 70 and may be accessed by a user via user computer 80 over

1 Internet connection 78. It is understood that user computer 80 is representative of any
2 device capable of accessing the internet, including but not limited to, portable computers,
3 pagers, and mobile telephones.

4 User information 74 is created by a user when the user subscribes to the service
5 provided by source portal 70. This information includes a user name and a user password,
6 which are used as security measures to correctly identify the user as well as for accessing
7 source user information 74. Destination portal 72 is similar to source portal 70, in that
8 destination portal 74 typically provides the same or similar services. However, user
9 information can migrate from source portal 70 to destination portal 72 when the services
10 provided by the respective portals are different.

11 In Figure 2, either destination portal 72, source portal 70, or a user may initiate the
12 transfer or migration of user information 74 to destination portal 72. Once user information
13 74 is extracted from source portal 70, it may be reformatted and stored as user information
14 76 on destination portal 72. Migration driver 92 is illustrated as being potentially accessible
15 by source portal 70, destination portal 72, or user computer 80. Preferably, all transfer of
16 user information 74 is through migration driver 92. However, location or migration driver
17 92 can alter as will be described in reference to Figure 4a through 4d below.

18 The transfer or migration of user information from source portal 70 to destination
19 portal 72 begins with a user supplying access information. The access information is
20 gathered from a user via user input page 84 displayed on monitor 82. The access
21 information is dependent upon the requirements of source portal 70 and destination portal
22 72. The access information required for source portal 70 is the information necessary to
23 access user information 74, which is typically the name of source portal 70, a user name and
24 a user password. The name of source portal 70 is typically a domain name. Further access

1 information may also include the destination portal, as well as the user name and user
2 password for the destination portal such that user information may be stored as user
3 information 76 on destination portal 72.

4 By providing the user name and the user password for both the source portal and the
5 destination portal, the automated process of migrating the user information is authorized by
6 the user. A user also supplies discretionary information, which is typically the data the user
7 desires to migrate or transfer. For instance, a user may choose to migrate the address book,
8 but not the old messages. The discretionary information is also gathered on user input page
9 84 and may be represented in HTML or any other suitable language or format. The access
10 and discretionary information may further be transmitted in a cookie or any other suitable
11 method or protocol.

12 Once user input page 84 is completed by the user, the migration process is initiated.
13 As the migration of user data or user information occurs, status window 86 is shown to the
14 user on monitor 82. Status window 86 is typically implemented with javascript and displays
15 the information in HTML, but can be implemented in other equally effective ways. Status
16 window 86 contains or displays information relating to the user information being
17 transferred from source portal 70 to destination portal 72, the percentage of the migration
18 completed; and errors that occur in the migration process, as well as the success or failure of
19 the migration. Status window 86 may also display or contain other information. Status
20 window 86 is not necessary for the migration to occur, but is a convenience to the user.
21 Status window 86 is preferably implemented using server push technology which indicates
22 that the user receives live updates from the migration process, which is typically executing
23 on destination portal 72.
24

1 Lastly, user confirmation page 88 is displayed which indicates the success or failure
2 of the entire migration process. If the migration of user information 74 from source portal
3 70 to destination portal 72 was successful, then the user is notified on user confirmation
4 page 88, which is then automatically closed. In sum, user interface 90 gathers the access
5 and discretionary information needed to initiate the migration process, shows the user status
6 information and notifies the user of the success or failure of the migration.

7 Figure 2, further illustrates one embodiment of migration driver 92, which is
8 responsible for the actual migration of user information 74. Migration driver 92 is typically
9 implemented in a script executing on destination portal 72 and is an example of computer-
10 executable instructions for migrating user information 74. Migration driver 92 executes
11 using portal objects 94, which supply various routines to migration driver 92. Exemplary
12 routines include: get - a routine that performs HTTP communications and builds HTML,
13 parse trees; and login - a routine which permits migration driver 92 to access a portal. Other
14 routines include OpenAddressBook, ReadAddressBook, and AddAddress, which are
15 routines relating to the manipulation of user information contained in address books. Portal
16 objects 94 have other routines needed to complete the migration process. For instance, if a
17 user desired to retrieve calendar information from source portal 70, then portal objects 94
18 would have routines that would open, read, write, and close the calendars at the particular
19 portals.

20 Another routine used by portal objects 94 is HTTP Document Object Model support
21 module (HDOM). HDOM is a subclass of HTML::Parser and inherits the parse function.
22 When a web page from a portal is retrieved, such as the login page of source portal 70,
23 HDOM parses the page to form a tree which consists of a list of tags followed by a subtree
24 of each tag's attribute set and any nested tags. The HDOM module also builds lists of links

1 for each document tag for better lookup efficiency. Other pages of source portal 70 are
2 similarly parsed.

3 The lookup directive associated with IIDOM is the main query or retrieval
4 mechanism. When destination portal 72 attempts to access source portal 70, the login page
5 of source portal 70 is parsed with HDOM and then migration driver 92, using IIDOM, must
6 lookup the field where the login name of the user is to be inserted. The lookup directive is a
7 string which identifies the desired HTML object/element to be retrieved and it has a specific
8 syntax, which is the text "doc" followed by a period. A tag-spec follows the period, which
9 identifies the tag migration driver 92 is trying to locate. The property follows the tag-spec,
10 which can be a list of all tag attributes, all text between opening and closing tags, or an
11 attribute name such as a URL or an action or some other attribute. For example, the
12 property "href" indicates that the URL is to be returned. The property "b.text" indicates that
13 the bolded text is to be returned. This list of properties is not exhaustive, but is exemplary
14 of potential properties. Other HDOM routines include parse and parse_file. In other words,
15 HDOM can be viewed as a routine of portal object 94 and HDOM has its own separate
16 routines.

17 Portal objects 94 also accomplish various tasks that are necessary for
18 communication. This includes initializing the HTML headers and the LWP objects, setting
19 up any proxy information and handling cookies. Also, portal objects 94, in combination
20 with HDOM modules enable migration driver 92 to locate and search for specific
21 information such as the information found in an address book.

22 As described above, portal objects 94 constitute a class of objects and portal
23 subclasses are therefore related to specific portals. When migration driver 92 is executing, a
24 portal object 94 is created for both source portal 70 and destination portal 72. The portal

1 object created for source portal 70 will differ from the portal object created for destination
2 portal 72 such that the specific portal objects can handle the differences that exist between
3 source portal 70 and destination portal 72. Those differences include tracking and traversing
4 the appropriate URLs, providing any required input, mapping address book entries into a
5 common hash, and other portal specific tasks.

6 Figure 3 illustrates one embodiment of a method for migrating user information from
7 one internet-based service provider to another. In step 100, the user access information is
8 obtained. User access information is needed to gain access to the user information on the
9 particular portal and typically comprises a user name and a user password. In step 100, user
10 access information is preferably obtained for both the source and destination portals. User
11 access information is an indication that the user has provided permission or authority to
12 enter a portal and access the user information stored at that portal.

13 In step 102, a portal object is created for both the source and destination portals.
14 There can be more than one source portal and more than one destination portal and a portal
15 object is created for each distinct portal. As described above, a portal object provides the
16 same routines for each separate portal, yet each portal object is specific to a particular portal.
17 For example, while each portal object provides a get routine, the get routine is usually
18 different for each portal because the portals are not similarly organized or designed.

19 In step 104, the source and destination portals are opened and accessed. Typically,
20 this entails using the previously obtained user name and user password to enter the portal.
21 In many instances, opening a portal is synonymous with logging into that portal via the login
22 web page presented by that portal. Opening a portal usually requires the use of the
23 previously created portal object and associated routines. For example, when a portal is first
24 accessed, the user name and user password must be supplied to the source portal. The portal

1 object created for that portal will employ its own HDOM routine to parse and find where on
2 the login page the user name and password are to be supplied. When this task is completed,
3 the user name and password are supplied to the source portal.

4 After the source and destination portals have been opened or accessed in step 104,
5 the user information located on the source portal is migrated to the destination portal. The
6 migration of user information involves more than transferring or retrieving user information.
7 The migration of user data involves finding or locating the user data by traversing the
8 appropriate URLs related to the source portal and analyzing or determining what that data
9 represents, i.e. address entries, names, e-mail text, etc. Once the user data or information
10 has been found, the user information is then transferred to the destination portal and can
11 occur in various ways. For example, the e-mail capability of the source portal may be
12 employed to e-mail the user information, which includes existing e-mail messages, to the
13 destination portal. In other embodiments, the user information is simply copied and
14 transmitted to the destination portal where it is stored or written to storage medium of the
15 destination portal. These examples are not intended to be limiting, but are exemplary of
16 ways to transfer the user information.

17 After the user information has been transferred, the final step relates to the user
18 information still present on the source portal. The user has various options, some of which
19 include deleting the user information from the source portal, altering the user information
20 and copying the user information. In step 108, the status of the migration is reported to the
21 user. The information displayed in step 108 can include, but is not limited to, the percent of
22 user information transmitted, the success or failure of the migration, and the state of the data
23 remaining on the source portal.
24

1 In step 110, both the source and destination portals are closed. This is represented,
2 in one embodiment, as logging out. This insures the closed portal knows that the user is no
3 longer present and is not using the user information.

4 Figures 4a, through 4d are intended to illustrate exemplary situations which may
5 arise in context of the present invention. Figures 4a through 4d are not intended to limit the
6 scope of the invention, rather they are intended as exemplary embodiments. Additionally,
7 Figures 4a through 4d demonstrate that the act of migrating user data from a source to a
8 destination can involve a varying number of active participants.

9 Figure 4a illustrates a source 202, which may be an internet based web page, an
10 internet based service provider, a source portal, or any other type of computer, software,
11 database or other storage device that contains or stores user data. Destination 214 is similar
12 to source 202 but it is not necessary that source 202 and destination 214 be exactly alike.
13 For instance, source 202 may be a web page and destination 214 may be an internet based
14 service provider. In any event, user data is typically retrieved from source 202 and
15 transferred or stored at destination 214.

16 Source 202 is typically connected with destination 214 via an internet connection
17 218, but any other type of connection, including direct connections, are possible. In this
18 case, migration driver 212 resides at destination 214. A user, using a user interface at user
19 computer 80, selects a source 202 and a destination 214. In this embodiment, destination
20 214 executes migration driver 212 to retrieve the user's data from source 202. Updates may
21 be sent to user computer 80 during the migration of the user data over connection 216,
22 which may also be an Internet connection or other connection.

23 Figure 4b is similar to Figure 4a, with the difference that migration driver 212
24 resides at source 202. In the embodiment of Figure 4b, source 202 accesses the user data

1 either using migration driver 212 and further executes migration driver 212 to send the user
2 data to destination 214. Because user data is already present at source 202, it is possible that
3 source 202 may access the user data without using migration driver 212. In Figures 4a and
4 4b, the transfer or migration of user data is from a source to a destination even though the
5 migration was initiated by a user.

6 Figure 4c illustrates an embodiment of the present invention where third party 220
7 hosts migration driver 212. Again, the user selects both the source and the destination of the
8 user data, but the transfer of user data occurs from source 202 to destination 214 through
9 third party 220. Third party 220, may be an internet service provider, a portal or other
10 device capable of hosting and executing migration driver 212.

11 In Figure 4d, migration driver 212 is present on user computer 80. As illustrated,
12 migration driver 212 was retrieved or downloaded from third party 220, but user computer
13 80 may obtain migration driver 212 in other manners. The user selects a source and a
14 destination and executes migration driver 212. The migration or transfer of user data is from
15 the source to migration driver 212 to the destination in this case. Preferably, the user
16 information passes through migration driver 212 in each of the embodiments described
17 herein, but it is possible for migration driver 212 to cause the user data to be transferred
18 directly from source 202 to destination 214.

19 The present invention may be embodied in other specific forms without departing
20 from its spirit or essential characteristics. The described embodiments are to be considered
21 in all respects only as illustrative and not restrictive. The scope of the invention is,
22 therefore, indicated by the appended claims rather than by the foregoing description. All
23 changes which come within the meaning and range of equivalency of the claims are to be
24 embraced within their scope.

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What is claimed and desired to be secured by United States Letters Patent is:

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1. In a system having a source portal and a destination portal, a method for migrating user information maintained by the source portal to the destination portal, the method comprising the steps of:

obtaining from the user, access information needed to access the user information maintained by the source portal;
entering the source portal using the access information;
locating the user information on the source portal;
extracting the user data from the source portal and sending the user information to a destination portal; and
storing the user information on the destination portal.

2. A method as in claim 1, wherein the access information comprises a user name and a user password.

3. A method as in claim 1, wherein the user information comprises one or more of the following:

e-mail messages, e-mail metadata, addresses, user preferences, or information entered into the source portal by the user.

4. A method as in claim 1, wherein the step of entering the source portal comprises supplying the access information to a login web page of the source portal.

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1 5. A method as in claim 1, wherein the step of extracting the user information
2 further comprises the step of traversing the source portal to find the location of the user
3 information on the source portal.

4
5 6. A method as in claim 1, further comprising the step of forwarding the user
6 information on the source portal via an e-mail.

7
8 7. A method as in claim 1, further comprising the step of deleting the user
9 information on the source portal.

10
11 8. A method as in claim 1, further comprising the step of copying the user
12 information on the source portal.

13
14 9. A method as in claim 1, further comprising the step of logging the user out of
15 both the source and destination portals.

16
17 10. A method as in claim 1, further comprising the step of updating the user as to
18 the status of the migration of user information.

19
20 11. A computer-readable medium having computer-executable instructions for
21 performing the steps recited in claim 1.

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1 12. In a system having a source portal, a method for extracting user data from the
2 source portal, the method comprising the steps of:

3 accessing the source portal using user access information, said user access
4 information being provided by a user;
5 traversing the source portal to locate the user data;
6 copying the user data; and
7 disposing with the user data as indicated by the user.

8
9 13. A method as in claim 12, wherein the access information comprises a user
10 name and a user password.

11
12 14. A method as in claim 12, wherein the user access information is entered into
13 a login web page of the source portal.

14
15 15. A method as in claim 12, wherein the user data further comprises information
16 entered into the source portal by the user.

17
18 16. A method as in claim 15, wherein the user data further comprises one or more
19 of the following:

20 e-mail messages, e-mail metadata, addresses, financial data, scheduling data,
21 or user preferences.

22
23 17. A method as in claim 12, further comprising the step of creating at least one
24 portal object.

18. A method as in claim 17, wherein the source portal and the destination portal are each associated with a separate portal object.

19. A method as in claim 18, wherein the portal object comprises methods used in one or more of the steps of claim 12.

20. A method as in claim 12, further comprising the step of deleting the user data located at the source portal.

21. A method as in claim 12, wherein the step of disposing with the user data comprises one or more of the following:

- deleting the user data located at the source portal;
- refraining from deleting the user data located at the source portal;
- transferring the user data to a destination portal;
- storing the user data at the destination portal;
- reformatting the user data for storage at the destination portal;
- storing the user data in a local repository on the user computer; and
- reformatting the user data for storage on the user's computing device.

22. A computer-readable medium having computer-executable instructions for performing the steps recited in claim 12.

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23. In an environment having a source portal and a destination portal, a method for permitting a user to automate the transfer of user information from the source portal to the destination portal comprising the steps of:

obtaining from the user, a first user name and a first user password for the source portal and a second user name and a second user password for the destination portal;

accessing the source portal and the user information using said first user name and said first user password;

accessing the destination portal using said second user name and said second user password;

retrieving the user information from the source portal and writing the user information to the destination portal; and

closing the source portal and the destination portal.

24. A method as in claim 23, further comprising the step of creating at least one portal object, wherein the source portal and the destination portal are each associated with a separate portal object.

25. A method as in claim 24, wherein the portal object comprises methods used in one or more of the steps of claim 23.

26. A method as in claim 23, wherein the step of retrieving the user information further comprises the steps of:

traversing the source portal to locate the user information;

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1 copying the user information; and

2 sending the user information to the destination portal.

3
4 27. A method as in claim 23, wherein the step of writing the user information to
5 the destination portal further comprises the step of storing the user information at the
6 destination portal such that it may be accessed by the user.

7
8 28. A method as in claim 23, further comprising the step of displaying to the
9 user, the status of the transfer of the user information.
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1 29. In an environment having a plurality of source portals and a plurality of
2 destination portal, a method for migrating user information from the source portal to the
3 destination portal, the method comprising the steps of:

4 allowing a user to select, through a user interface, a source and a destination;
5 and
6 executing a migration driver, wherein the migration driver causes the user
7 data located at the source to be transferred to the destination.
8

9 30. A method as defined in claim 29, wherein the migration driver resides at the
10 destination.
11

12 31. A method as defined in claim 29, wherein the migration driver resides at the
13 source.
14

15 32. A method as defined in claim 29, wherein the migration driver resides at a
16 computer of the user.
17

18 33. A method as defined in claim 29, wherein the migration driver resides with a
19 third party.
20

21 34. A method as defined in claim 29, wherein the transfer of the user data from
22 the source to the destination is through the migration driver.
23
24

1 35. In a system having a source portal and a destination portal, a computer
2 program product for migrating user information from the source portal to the destination
3 portal, the computer program product comprising:

4 a computer-readable medium carrying computer-executable instructions for
5 implementing the method wherein the computer-executable instructions comprise:

6 program code means for obtaining user access information;

7 program code means for opening the source portal and the destination
8 portal using the user access information;

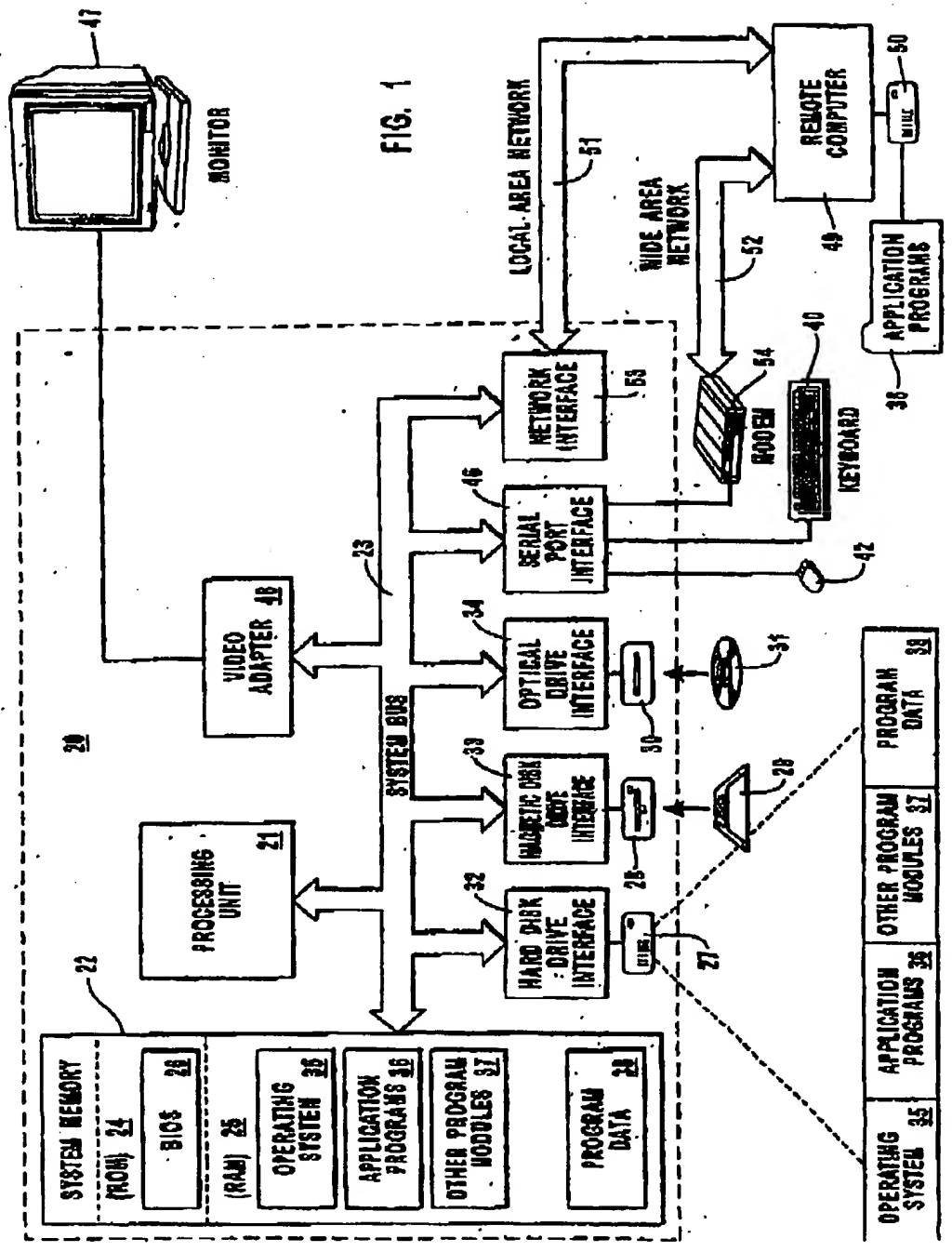
9 program code means for locating the user information on the source
10 portal and for transferring the user information to the destination portal; and

11 program code means for storing the user information on the
12 destination portal.

13
14 36. A computer program product as in claim 35, wherein the computer
15 executable instructions further comprise program code means for creating at least one portal
16 object.

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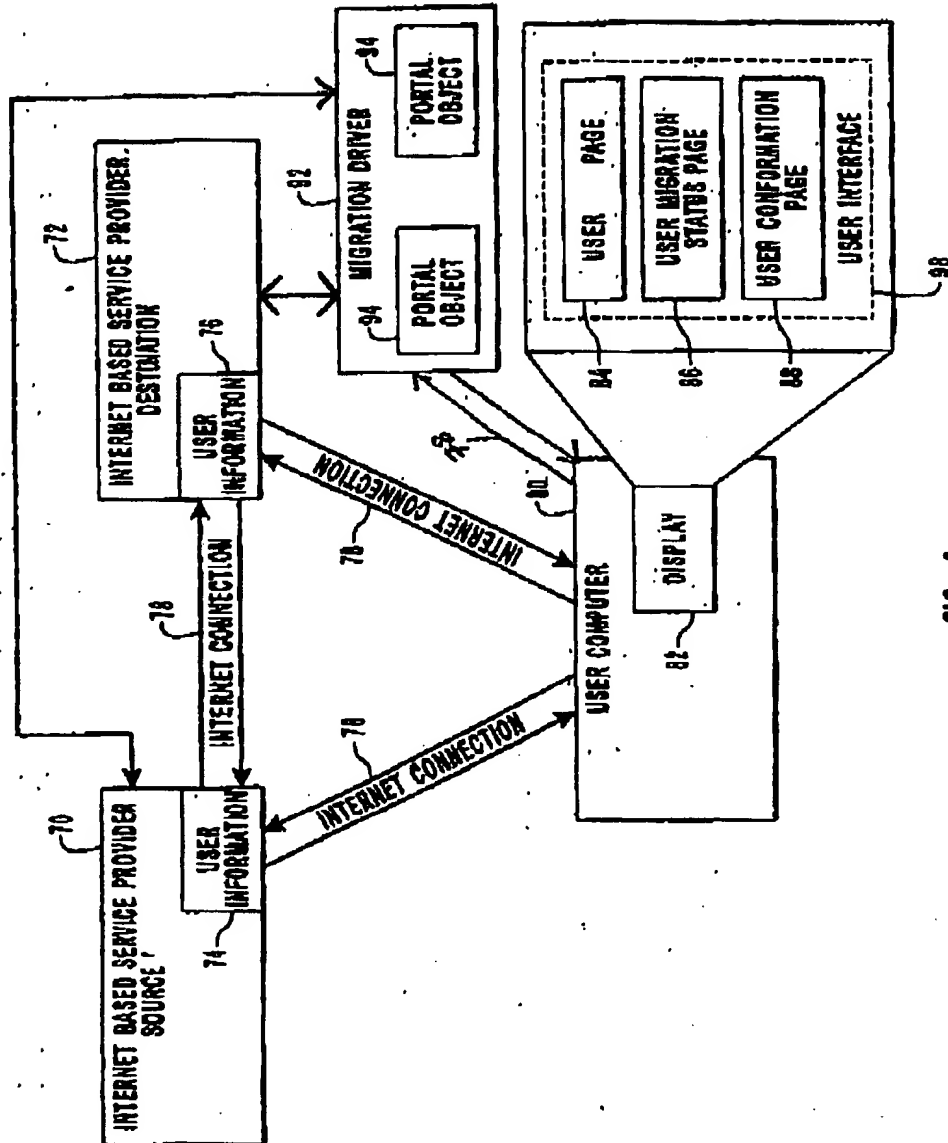


FIG. 2

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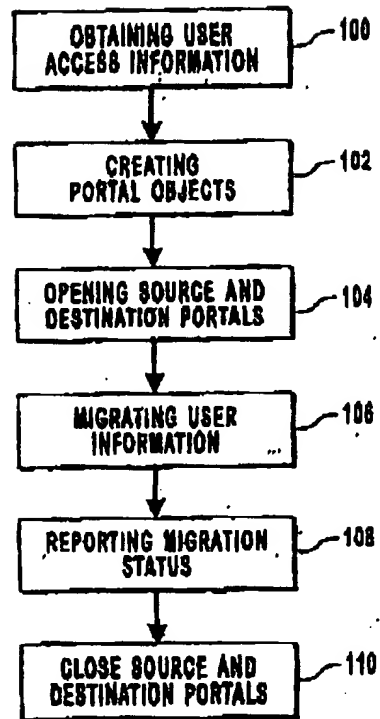


FIG. 3

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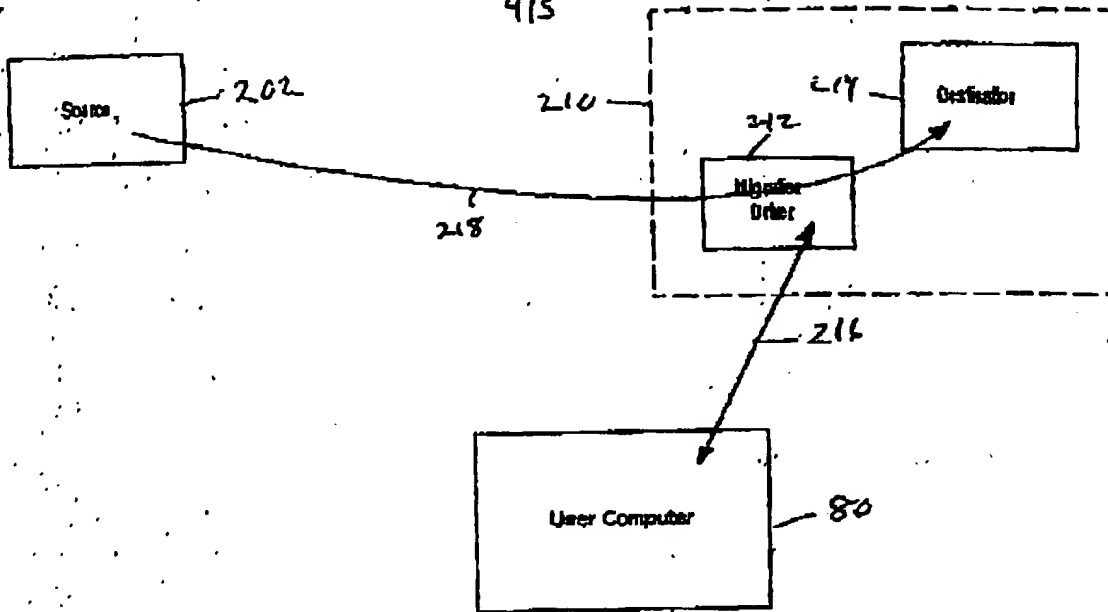


FIG. 4a

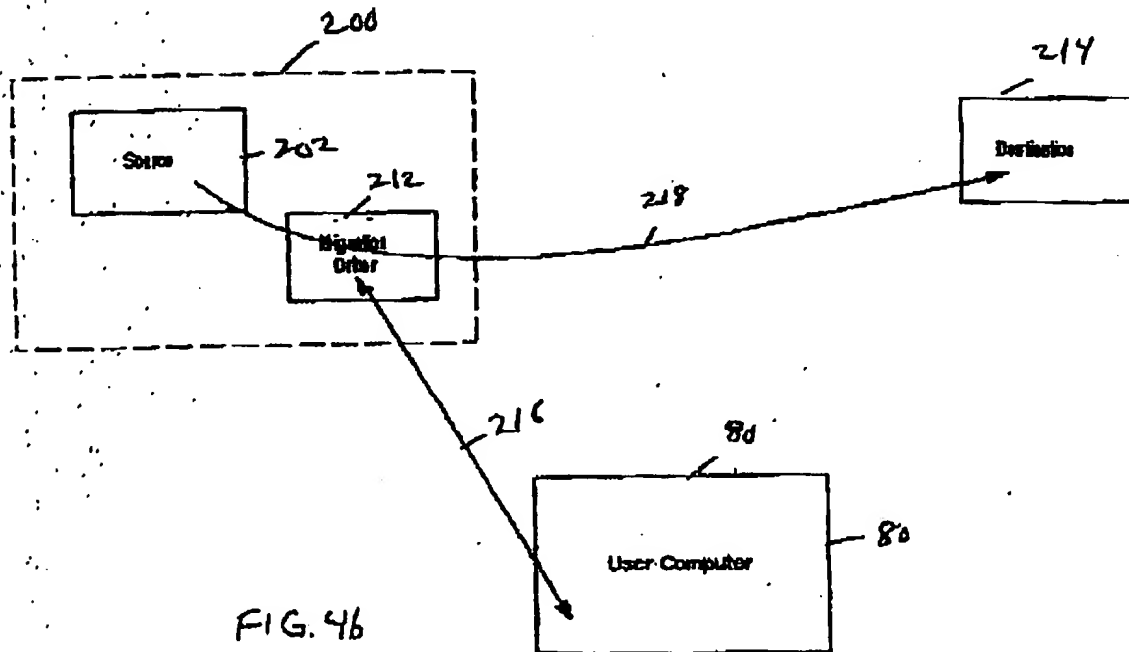


FIG. 4b

